

Commercial Vehicle Weight

Federal Weight Standards

Maximum Axle Weights

- | Federal | State of Michigan |
|-------------------------|---------------------------|
| • Steer Axle: | • Steer Axle: |
| – 12,000 lbs. | – 18,000 lbs. |
| • Single Axle: | • Single Axle: |
| – 20,000 lbs. | – 18,000 lbs. |
| • Tandem Axle: | • Tandem Axle: |
| – 34,000 lbs. | – 32,000 lbs. |
| • Gross Vehicle Weight: | • Gross Vehicle Weight: |
| – 80,000 lbs. S | – 164,000 lbs. Steer axle |

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80,000 # Federal Weight Standards,

- The allowable maximum weights:
 - Steering axle is 12,000 lbs., distributed between two (2) tires, each supporting 6,000 lbs. per tire.
 - Tractor drive tandem axles (2) is 34,000 lbs., distributed between four (4) wheel positions, each with two (2) tires, carrying 4,250 lbs. per wheel.
 - Trailer tandem axles (2) is 34,000 lbs., distributed between four (4) wheel positions, again each with two (2) tires, carrying 4,250 lbs. per tire.
 - Trailers with 122" spread axle setup allows 40,000 lbs. distributed over four (4) wheel positions each with two (2) tires, carrying 5,000 lbs. per tire.
- This vehicle, carrying 80,000 pounds, would be responsible to stop roughly 8,000 pounds per wheel position.

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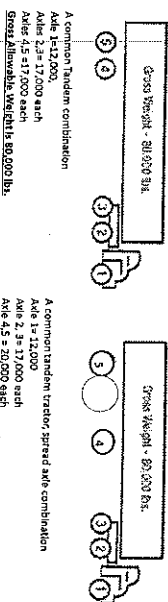
Federal Standards

- National weight standards apply to commercial vehicle operations on the Interstate Highway System, an approximately 40,000-mile system of limited access, divided highways that spans the nation.
- Federal commercial vehicle maximum standards on the Interstate Highway System are:
 - Steer Axle: 12,000 lbs.
 - Single Axle: 20,000 lbs.
 - Tandem Axle: 34,000 lbs.
 - Gross Vehicle Weight: 80,000 lbs.

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Weight per Axle

- Truck weight restrictions use the number of axles on a vehicle as a basic guideline. According to DOT weight regulations, an axle can help distribute the gross weight of the vehicle.
- A vehicle with a single rear axle may only haul 20,000 lbs.
- A tandem axle vehicle may haul 34,000 lbs. (if axles are spaced between 40" apart but not more than 96" apart).
- A two axle Group may haul 40,000 lbs., (if axles are spaced at 122" or more).
- The maximum gross vehicle weight for any commercial vehicle is 80,000 lbs.



- The DOT also establishes truck weight restrictions for bridges.

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Intro

- My name is Bill Gale, and have been a resident of the State of Michigan for the last 35 years. For the last 5 ½ years, I have been employed by Universal Truckload Services, where I serve as the Vice President of Equipment Services. I have been continuously employed in the Transportation field since March 1977, always in the maintenance and equipment departments. My duties have encompassed everything from Mechanics helper, Mechanic, Shop Foreman, Regional Manager, Division Manager, and now Vice President.
- Universal overseer's six major Trucking Companies, including Universal Am-Can, Great American Lines, Mason Dixon Truck Lines, Louisiana Transportation, ETI and Mason Dixon Intermodal.
- These companies have over 3200 independent Owner Operators leased on to these companies, as well as over 125 company drivers.
- We own over 3,400 pieces of equipment that includes tractors, trailers, chassis', lift and support equipment.
- Our trailers are a mix of vans, flats and reefers for a total of 1605 units
 - 890 vans and reefers, 715 flat bed trailers
 - 124 heavy haul (7.7%)
 - 31 Michigan Heavy Haul (1.9%)

Our purpose here today is to

1. Show our support for quality Roads in our state, as they are a vital part of our companies operation for safety and cost of doing business,
2. To explain why we see multi-axes as a vital part of our day to day operations, and the positive effect they have not only on our business climate, but also on our roads.

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Michigan 8-Axle Trailer

- The allowable maximum weights:
 - Steering axle is 12,000 pounds**, distributed between two (2) tires, each supporting 6,000 pounds per tire.
 - Tractor drive tandem axles (2) is 32,000 pounds, distributed between four (4) wheel positions, each with two (2) tires, carrying 4,000 pounds per wheel, (250 # less than the Federal Standards). A reduction of 6% less weight per tire against the road.
 - Trailer eight axles (8) is 104,000 pounds, distributed between sixteen (16) wheel positions, again each with two (2) tires, carrying 3,250 pounds per tire, (1,000 #s less than the Federal Standard). A reduction of 30.7% less weight per tire against the road.
- A Trailer grossing 80,000 lbs., with 5-axes, would require each axle to support and stop an average of 16,000 lbs., the same vehicle, grossing 148,000 pounds, (68,000#s more than the Federal Standard), would require each axle to support and stop an average of 13,454 lbs., or 2,546 lbs. less per axle, or 15.9% less weight distributed over the road surface.

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Braking

<u>Federal Weight Limits</u>				<u>Michigan Multi-axle</u>			
	<u>Each Axle</u>	<u>#axles</u>	<u>Combined</u>		<u>Each Axle</u>	<u>#axles</u>	<u>Combined</u>
Steer Axle	12,000	1	12,000	15,000	1	1	15,000
Tandem Drive Axles	17,000	2	34,000	16,000	2	2	32,000
Trailer Axles	17,000	2	34,000	18,000	1	1	18,000
				13,000	7	7	91,000
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	Axles	5	80,000			11	
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Gross Weights							
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Braking Weight per Axle							
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Wheel position	10	8,000	11	14,182			
Tire	18	4,444	42	3,714			

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Effect of Tires on Roads

- Tires are rated by the width of tread for the allowable weight distributed on the road way.
- Michigan Vehicle Code Section 257.722 part (7) The normal size of tires shall be the rated size as published by the manufacturers, and the maximum wheel load permissible for any wheel shall not exceed 700 pounds per inch of width of tire.

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Standard Tires Used

- The most commonly used tires are mounted on a rim 8.25" wide and 22.5" diameter, will have an overall inflated width between 11.2" to 12".
- At 700 pounds per inch, this would allow each tire to support safely up to 7840 pounds in a single wheel application (steering axle), and up to 15,680 pounds in a dual wheel position.

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Tire Note

- Michigan does allow in excess of the 12,000 pounds on the steering axle, as long as the axle is rated by the manufacture and the tire size, rating and width still will allow its weight.
- A standard balloon tire, with a 12.5" overall inflated width is capable of carrying 8,750 #'s per tire or 17,500 #'s on the axle.

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Other Factors

- Average weight of a Tractor and Trailer with 5 axles 32,000 lbs.
- Average weight of a Tractor and Trailer with 11 axles, utilizing lighter weight trailers 42,000 lbs.
- The maximum payload carried on each can reach:
 - 5 axle unit: 48,000 pounds
 - 11 axle unit: 109,000 pounds (227% more)

Thus reducing the # of vehicles on our Highways carrying the same quantity.

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Fuel Economy

- Based on our own companies fuel averages
 - The standard 5 axle units average: 5.72 mpg (\$0.689/mi)
 - The multi axle units average: 4.53 mpg (\$0.883/mi)
- Assuming cost of fuel at \$4.00 per gallon,
The cost to move one ton of freight per mile is:
- 5 axle units: \$0.02913/ton (24 tons)
-11 axle units: \$0.01766/ton (50 tons)
- Utilizing the multi-axle units equates to a 64.9% reduction in fuel usage.

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In Conclusion

- Safety:** Multi Axle units are equipped with more brakes on the vehicle and each brake stopping less weight, (an average of 13-20%).
- Capacity:** With increased carrying capacity, multi axle units make it possible to have less trucks on our highways, (hauling up to 2.1 times more freight).
- Environment:** With the increased capacity and less fuel needed (up to 75% less) to move more weight, reduces our needs for foreign oil and better air quality.
- Commerce:** Michigan business's and jobs are relying on multi-axle equipment to allow them to remain competitive in there own business.
- Driver Shortage:** Allows us to better utilize our Michigan Driver pool, by being more productive.

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